

INTERNET PROTOCOL OVER WDM NETWORK, AND PACKET  
COMMUNICATION SYSTEM AND METHOD IN THE IPOW NETWORK

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### ABSTRACT OF THE DISCLOSURE

There is disclosed an internet protocol over WDM (IPOW) network structure which can directly route/transmit packets via a wavelength division multiplexing (WDM) optical communication network, and a packet transmission system in the network structure and method using the network structure. The internet protocol over wavelength division multiplexing (WDM) network structure comprising: a plurality of sub-ring for connecting n number of terminals (where n is a positive integer) to which unique user wave lengths are respectively allocated; a main ring for connecting n number of connection nodes connecting sub-rings to which unique user wave lengths are respectively allocated; a single sub-ring controller for controlling the flows of a packet transmitted/received inside the sub-ring and a packet transmitted/received between the sub-ring and the main ring; and a main ring controller connected to the single sub-ring and the main ring, and controlling the flow of a packet transmitted/received inside the main ring, wherein the terminals and connection nodes each add/drop only their own unique wavelength signals, the sub-ring controller and main ring controller drop all the wavelength division multiplexed signals to de-multiplex the signals, load each of the signals on their unique user wavelengths in their destination terminals, and then multiplex again the signals to transmit to the sub-ring and main ring, the sub-ring controller adds the identifying code (which is called a  $\lambda$  tag) of the sub-ring having a destination terminal, to the transmitted packet, and then transmits it to the main ring. The present invention has an advantage that it can route the packet at high speed, and also significantly simplifies a network structure. In addition, the present invention can process several tens of terabit traffic, expensive optical elements or optical systems, and a high-performance traffic routing apparatus such as a terra-bit level controller, etc.